

# SQL Server Always Encrypted with Azure Key Vault

Duration 1 Day



Code: Azure-301

## About this course

This half-day course provides a deep dive into SQL Always Encrypted with Local Key Store and Azure Key Vault, enabling secure encryption of sensitive data in SQL Server. Participants will learn how to configure Always Encrypted, integrate with Azure Key Vault for key management, and troubleshoot common issues. Through hands-on exercises, attendees will gain practical experience in securing database operations while maintaining performance and compliance. Ideal for IT professionals, DBAs, and security engineers looking to enhance data protection strategies.

**Audience(s):** IT administrators, SQL DBA

**Technology:** SQL Server, Microsoft Azure

**Time:** 9:00-12:00 / 13:00-16:00

**Language:** Speaker Thai / Presentation English & Thai

## Module 1: Introduction to SQL Always Encrypted

### Lessons:

- What is SQL Always Encrypted
- Column keys
- Types of encryption
- Feature Limitation
- Always Encrypted with secure enclaves
- Attestation
- SQL Server with attestation using HGS
- Local Key Store
- Create a self-signed certificates
- About Azure Key Vault
- Process flow of using the Azure Key Vault
- Column Master Keys in Azure Key Vault
- Landing zone
- Example Select Query
- Parameterization for Always Encrypted

### **Module 2: Setting Up SQL Always Encrypted with Local Key Store (Hand on Labs)**

#### **Lessons:**

- Download and install SQL Server Management Studio
- Create a simple database with table
- Create Self Certificate
- Create Column Master Keys and Encryption Keys
- Configure Deterministic Encrypt Column
- Query encrypted column
- Enable Always Encrypted to select query
- Export and import Certificate
- Enable Parameterization
- Configure Randomized Encrypt Column
- Enable secure enclaves in SQL (unattested)
- Create Column Master Keys and Encryption Keys with enclave
- Question

### **Module 3: SQL Server with attestation using HGS (Hand on Labs)**

#### **Lessons:**

- Prerequisites for Install HGS Server
- Configure the HGS
- Configure the SQL Server as a guarded host
- Connect SQL Server with HGS
- Configure HGS for HTTPS communication

### **Module 4: Setup Azure Key vault (Hand on Labs)**

#### **Lessons:**

- Set up a Microsoft Entra ID
- Set up a Microsoft Entra service principal
- Create Azure Key vault
- Setup Access control for Azure Key vault
- Create a key in Azure Key vault

### **Module 5: Setting up SQL Always Encrypted with Azure Key vault (Hand on Labs)**

#### **Lessons:**

- Create Column Master Keys and Encryption Keys with Azure Key vault
- Configure Encrypt Column with Azure Key vault
- Query encrypted column
- Monitoring Azure key vault total requests

### **Module 6: Integration with Web Application (Hand on Labs)**

#### **Lessons:**

- Integration Process
- Integrate applications with Always Encrypted
- Install Visual Studio
- Setup and configure for source code, package
- Demo

### **Module 7: Managing & Troubleshooting SQL Always Encrypted (Hand on Labs)**

#### **Lessons:**

- Key Rotation & Lifecycle Management
- Rotate Local Store Key
- Key Rotation process
- Azure Key vault Rotation policy
- Set key Rotation policy